

with the animal ovum, where a similar coating is well known to be produced over it, exactly at a corresponding period.

In a separate paper\*, I have pointed out many singular anomalies observable in the structure of seeds, that are not reconcilable with the ordinary hypothesis. I have since collected numerous other curious and novel facts tending to support my views, showing the unusual developments observed in the *Colletieæ* and in the *Rhamnaceæ* in general, the still more novel form of growth of the seeds of the *Anacardiaceæ*, the peculiar structure in those of the *Styraceæ*, *Canellaceæ*, *Winteraceæ*, *Lardizabalaceæ*, and several other families, of which, after patient research and careful investigation, I have prepared monographs, which in succession will appear in this Journal, and which will afterwards be reproduced in my 'Contributions' accompanied by numerous plates and copious analytical details. In most cases, in the above-mentioned families, the outer coating of the seed appears under the form of a crustaceous shell, exterior to, and quite free from a fleshy tunic, which encloses the cord of the raphe within its tissues: although the former coating is usually designated as the testa, it cannot under any hypothesis be considered as a development of the primine: it appears to me a perfect arillus,—satisfactory proof of which is offered in *Lardizabala*, *Lithræa*, and numerous other instances.

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XXVI.—*Some Observations on Professor Agassiz's Criticisms on the "Catalogue of Shield Reptiles in the Collection of the British Museum."* By Dr. J. E. GRAY, F.R.S., V.P.Z.S., P. Ent. Soc. &c. &c.

I HAVE lately received, through the kindness of the author, a copy of Professor Agassiz's "Contributions to the Natural History of the United States: First Monograph, in Three Parts: I. Essay on Classification. II. North American Testudinata. III. Embryology of the Turtle, with thirty-four Plates," a highly valuable and very important contribution to the natural history of the Testudinata; and which is accompanied with a large number of remarkably well executed plates, showing the development of the embryo and the young animal of several species of the Testudinata inhabiting the United States, and some plates showing the change in the general colours of one of the species. In the Appendix and Errata to this work there occur, among observations respecting the 'Catalogue of Shield Reptiles,' the following remarks: "Among his [Dr. Gray's] North American *Emys* there are several which are only nominal species. I trust

\* Linn. Trans. xxii. 97.

that the evidence I have adduced in the case of *Ptychemys rugosa* is sufficient to show that in some types the colour does not afford specific characters. This is the case to the same extent with *Ptychemys concinna*, which is mentioned under four different names by Dr. Gray,—as *Emys ornata*, *E. Floridana*, *E. annulifera*, and *Pseudemys concinna*. *Ptychemys Mobilensis* appears twice, as *Emys Mobilensis* and as *E. ventricosa*. *Ptychemys rugosa* also appears twice, as *Emys rivulata* and *Pseudemys serrata*. These facts are sufficient to show that Gray's genus *Pseudemys* is not well founded, as the two species which he himself had an opportunity of examining are only varieties of other species, which he refers to the old genus *Emys*. I am unable to refer his *Emys venusta* with certainty, as his figure, though well drawn, does not exhibit the generic characters. I believe it, however, to be one of the many varieties of *Ptychemys concinna*. The same remark applies to *Emys callirostris*" (p. 641).

I will proceed to examine these observations *seriatim*.

I am quite aware, from the examination of living specimens of *Emydes*, that they change considerably in colour as they increase in age, and under different local or accidental circumstances; that is to say, that the colours, which are very distinct and well defined in the young, become more diffused and obscure in the adult; but at the same time I have also observed that the disposition of the colours does not change, and for that reason, in the Catalogue above referred to, I attempted to divide the species of the genus *Emys* according to the system of colouring, that is to say, according to the disposition of the coloured rings or streaks, which are best observed in young specimens. It is this which renders the study of the young individual so important, and the want of sufficient attention to it by preceding herpetologists renders their figures and descriptions so difficult to identify; and I think that if Professor Agassiz had paid more attention to it, he would not have proposed to unite under one name species so distinct as those in the observation quoted.

I will now proceed to the second subject,—that I have mentioned one species under four names,—from which one would naturally suppose that I had described it four times over, after examination, which is not the case; for, as far as *E. Floridana* is concerned, I have only inserted it in the Catalogue on the authority of Leconte, Duméril and Bibron, Holbrook, and Bonaparte, who have all considered it as distinct. When the Catalogue was published, I had not been able to procure a specimen. As regards *Emys annulifera*, which is only described from a very young specimen without a habitat, and which may be African or Indian as probably as American, I can only say that I compared it

with young specimens of *E. ornata* and *P. concinna* of the same size, and was convinced of its distinctness, and I am certain that if Professor Agassiz had had the same opportunity (which he cannot have had, as the specimen has not been even figured), he would have come to the same conclusion as I have done,—and yet he gives his opinion on the subject *ex cathedra* without the slightest doubt. If he had compared the system of coloration, as I have done, of *Emys ornata*, *Emys annulifera*, and *Pseudemys concinna* in their young state, and *E. ornata* and *P. concinna* in their various states of growth, he never could have made such a statement that they were the same species, or have thought it possible that *E. venusta* and *E. callirostris* were only varieties of the same. Such random assertions are very injurious to the progress of science, especially when they profess to be made on special and mature study of the subject; and it is curious that Professor Agassiz, who has figured the young state of many of the North American species, does not appear to have properly estimated the important characters they present, or to have studied the manner in which the colouring is modified by the growth of the shields in the different species.

I have nothing to object to the proposal to unite *Emys Mobilensis* to *E. ventricosa*, except that the statement as made by M. Agassiz conveys a misrepresentation of the facts; for in the Catalogue, p. 28, under the citation of *E. Mobilensis*, from Holbrook, I state, “The figures (Holbrook’s) greatly resemble my *E. ventricosa*, but the margin is represented as having sutural spots, which is not the case in that animal. See No. 25;” and under “25. *Emys ventricosa*,” I quote “? *Emys Mobilensis*, Holbrook,” as a synonym, and, in the observations, enter into particulars showing that they may probably be the same, as Mr. Holbrook’s artist is not always accurate in the disposition of the colours of the lower edge of the shells.

In the Catalogue I make the following observation respecting *E. rivulata*: “I describe this species with doubt, as I have only seen a single shell, in its adult state, without the animal;” and I may observe, that its North American origin is even doubtful. The general form and structure of *Emys rivulata* is so exceedingly unlike any other *Emys*, that I was induced to describe it without waiting for other specimens; but since Professor Agassiz’s observations, I have compared it with our nearly adult specimen of *Pseudemys serrata*, and there is a certain amount of resemblance between them; so that I will not take upon myself to say that they are certainly distinct; but if they are alike, the Museum specimen is a very remarkable variety.

I may observe, that as the shell from which the species was described is without its head or skull, and therefore does not

present the characters by which the genus *Pseudemys* is separated from *Emys*, its being retained in the genus *Emys* by no means shows that the genus *Pseudemys* is not well founded. But on this subject I will make my stand on the fact, that *Emys ornata*, which Professor Agassiz unites with *Emys venusta*, and *E. callirostris*, which he thinks may be the same as *Pseudemys concinna*, are true *Emydes*, and not *Pseudemydes*, according to the characters by which I have separated those genera in the work above referred to; and that these characters, founded on the form and development of the lower jaw, on the extent of the horny sheath of the lower mandible, and on the scaling of the feet, are more important anatomical characters for the foundation of a genus than those used to distinguish the many genera into which Professor Agassiz proposes to separate the American *Emydes*,—if they have any characters at all; for it is to be observed that Professor Agassiz does not give any synoptic characters for the families, subfamilies, genera, or species, but only indefinite general observations.

It is curious that Professor Agassiz, who has so minutely subdivided the genera of the North American *Emydeæ*, and described so many new species, should have so completely overlooked these important characters, both in his description and figures, that he has proposed to mould into one species the animals belonging to such distinct genera, founded on characters that must have an important influence on the habits of the species.

Further on, Professor Agassiz observes:—“Gray describes two *Cinosternons* from North America as new species, founded upon young specimens. I confess my inability to distinguish them from *Cin. Pennsylvanicum*. *Cin. punctatum* seems to me to be the young male, and *Cin. Hippocrepis* the young female with a rather narrow hind lobe to the sternum, as is occasionally the case in *Cin. Pennsylvanicum*. I have seen such large numbers of *Cinosternum Pennsylvanicum*, that I feel little doubt upon this point” (p. 642). This is a very distinct and positive statement, apparently founded on actual observation; but let us now examine the confidence to be placed in it.

On turning to Professor Agassiz's account of *Cinosternoidæ* proper, I find he divides the North American species into—“1. *Thyrosternon Pennsylvanicum*, Agass.; the young are represented, pl. 4. f. 7, 12, and pl. 5. f. 16, 17. 2. *Thyrosternon Sonoriense*, Ag.; the young are represented, pl. 5. f. 11, under the name of *Cinosternon Sonoriense*, Le C. 3. *Thyrosternon integrum*, Ag. 4. *Platythyra flavescens*; they are represented, pl. 5. f. 12, 15.” What was my astonishment, on referring to the plates, to find that the figures represented the three species I had

figured, and which we are informed, in the above note, are male and female of *Cinosternon Pennsylvanicum*; the "young female," which I am accused of making a species, being in his own work considered a distinct genus from the *Cinosternon* or *Thyrosternon Pennsylvanicum*!

If any one will take the trouble to compare the figures in the two works, I think they will have little doubt that the synonyma will stand thus:—

1. *Kinosternon Pennsylvanicum*, junior, Gray, Cat. t. 20 C. f. 1, 2, = *Thyrosternon Pennsylvanicum*, Agassiz, p. 428; *Cinosternum Pennsylvanicum*, pl. 4. f. 7, 12, pl. 5. f. 16, 17.
2. *Kinosternon Hippocrepis*, junior, Gray, Cat. t. 20 C. f. 3, 4, = *Platythyra flavescens*, Ag. p. 430; *Cinosternum flavescens*, Ag. pl. 5. f. 12, 15.
3. *Kinosternon punctatum*, junior, Gray, Cat. t. 20 C. f. 5, 6, = *Thyrosternon Sonoriense*, Ag. 428; *Cinosternum Sonoriense*, Ag. pl. 5. f. 8, 11.

I do not think it necessary to take any notice of the other observations in this brief communication, but shall refer to them in the Appendix to my Catalogue, which is in the press.

#### BIBLIOGRAPHICAL NOTICE.

*Contributions to the Natural History of the United States of America.* By LOUIS AGASSIZ. Vols. I. and II. 4to. Boston: Little, Brown & Co. London: Trübner & Co. 1857.

THE first two volumes of Agassiz's 'Contributions to American Zoology,' so long announced, and so anxiously expected by his friends on both sides of the Atlantic, have at length made their appearance. They contain, first, an essay on general classification, forming an introduction to the whole work; and secondly, the results of the author's investigations on the *Testudinata*, to which he has devoted much time and toil during the last few years. This is divided into two parts, the first containing a special account of the North American members of the group, and the second an extended and laborious treatise on their embryology. The first portion of this book is of a nature so generally interesting to all who take pleasure in studying the laws and objects of creation,—it is so fairly and beautifully written, and gives a view of the subject so much more complete and philosophical than anything of the sort yet attempted, that it cannot but be regretted that it should be obtainable only in conjunction with the bulky work on a special subject, and which is, moreover, to be

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